

Geobiology and Geomicrobiology Division of the Geological Society of America Newsletter

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Fall 2004

GBGM Division Chair's Message

Though my year as Division Chair passed quickly, we have made progress in a few key areas:

Open Business Meeting at GSA Annual Meeting in Denver: Our Division will sponsor an open business meeting on Tuesday, November 9, from 12:15-1:15PM, Room 102, CCC, at the GSA Annual Meeting in Denver. We will provide free lunch for the first 80 attendees who pass through the door! In addition to discussing business-related items, we will hear from guest speakers about progress being made in several areas of biogeoscience. Topics covered at the meeting are outlined elsewhere in this newsletter.

Volunteers Needed: For the first time, our Division will be hosting a booth in the Exhibit Hall at the Denver meeting. We will be tri-sponsoring the booth with the Sedimentary Geology Division and the Limnology Division. In doing so, we hope to increase the profile of the GBGM Division and, of course, increase communication between the three closely related Divisions sharing the booth. If you or your students can support this Division effort by volunteering to staff the booth for a few hours during the meeting, please let me know at cadys@pdx.edu. In any case, be sure to drop by and say hello – we'd like to make this an annual tradition, and your feedback will be helpful.

GBGM Sponsored Sessions at GSA: In addition to increasing the number of Topical and Disciplinary Sessions this year, our Division is sponsoring a Pardee

Keynote Symposium (see announcement on page 3 of this newsletter).

Welcome New GBGM Officers: Our incoming Division Chair is Jack Farmer, and Bruce Fouke moves to First Vice-Chair. We need your **nominations** for a Second Vice-Chair. Please send your nominations to cadys@pdx.edu by 11/8/04! The new Second Vice-Chair will be announced at the business meeting.

Announcing:

<http://www.biogeosciences.org>

This is an innovative new website that meets one of our Division's primary efforts to bring together its diverse membership. The website will play an increasingly important and vital role in the development of the fields of geobiology and geomicrobiology in the years to come. See announcement on page 3 in this newsletter.

I look forward to seeing you in Denver and thank you in advance for your continued support of our Division and for sharing ideas to help our Division grow as you move through your careers in the biogeosciences.

- Sherry L. Cady
GBGM Division Chair, 2003-2004

Message from the GBGM Editor

Hello everybody. We've finally managed to get an issue of our newsletter together. It's been a long time coming, and we're still working on figuring out exactly what it's going to be. We will certainly be including announcements of meetings, programs and anything else of interest to the geobiology and geomicrobiology

community. If there's anything else that you think should be included in the newsletter, or if you have any announcements yourself please feel free to send them to me: kraussd@bc.edu. Please make sure that you put GBGM in the subject line. We plan to issue this newsletter quarterly from now on, with issues tentatively scheduled to appear in October, January, April and July. I'll be looking forward to hearing from you. Thanks.

- David A. Krauss
GBGM Newsletter Editor

GBGM Treasurer's Report from J. Bret Bennington

Our financial activity for the previous 13 months ending June 30, 2004:

Dues income:	\$ 4,114.18
Expenses:	\$ 514.94
Net Income:	\$ 3,599.24

Total Net Assets: \$ 4,169.90

Winter Division Chair Meeting at GSA Headquarters

Division Chairs attend a meeting at GSA Headquarters in Boulder in February. Divisions are responsible for the expenses of their Chairs for attending the meeting, with the good news exception that as of 2005, GSA HQ will provide \$200 support for the travel expenses of each Division Chair who attends the meeting.

GENERAL ANNOUNCEMENTS:

Calling all Artists: We Need a Logo

As one of the newest divisions within GSA, we do not yet have our own division logo. If anybody out there has an artistic flair, we would love to get your submissions for consideration. We'll put them out for our members to vote on in the next newsletter. Please send electronic submissions to David Krauss at kraussd@bc.edu by 1/15/05.

We are also soliciting ideas for coffee mugs and T-shirts to be offered at future meetings. Please put your artistic talents to work for the Division!

GBGM Booth at GSA

We are looking for help manning the GBGM booth at the GSA Annual Meeting next week. If anybody can give us some time, we'd really appreciate it. Please contact cadys@pdx.edu asap.

GBGM Division OPEN BUSINESS MEETING

Free Lunch for the first 80 Division Members at the GSA Annual Meeting

The GBGM Division Meeting will be held in the Colorado Convention Center, Room 102, 12:15-1:15pm, Tues., Nov. 9, 2004.

It's time we revive the excitement that generated this Division! We hope to see all of you there. The tentative agenda for our one hour meeting is:

- 1) Update on Division Progress: Updated bylaws, Council responsibilities, financial report, goals to increase Division assets, future awards for students, need for GBGM website manager.
- 2) Vote for GBGM Second Vice-Chair for 2004-2005.
- 3) Introduce biogeosciences.org, a new online resource for students, established and entering researchers, faculty, teachers, students, and the general public.
- 4) NSF Program Manager Enriqueta Berrera will explain how the restructuring of EAR at NSF benefits geobiologists and geomicrobiologists.
- 5) Discuss organizing a Geobiology Workshop in 2005 and a Geomicrobiology Workshop in 2006.
- 6) Pass the torch to our new Division Chair Jack Farmer - future items.

Launch of BIOGEOSCIENCES.ORG

by Jean-Pierre Gattuso

Reprinted without permission from "The Eggs," Issue #08, 30 June 2004.
(*The Eggs* is a Newsletter and Information Service for the European Geophysical Union: <http://www.the-eggs.org>.)

<http://www.biogeosciences.org>

An innovative new Web site, Biogeosciences.org bridging the earth and life sciences went online June 8th, providing a single resource for all things related to biogeoscience.

Biogeosciences.org is a natural home for biogeoscience discussions, resources, and promotion.

The non-commercial website, supported by a grant from the Biogeosciences Program of the National Science Foundation, draws from several partnered professional societies* and elsewhere to present an outstanding collection of biogeoscience resources for all levels of education and interest. The dynamic website is expected to grow and change reflecting the trends in biogeo-science and usage needs.

Basic biogeoscience links, background information, and program resources are available, along with more detailed information on jobs, funding, and research opportunities. The new website has comprehensive lists of degree and research programs, applicable journals and other publications, and a complete database of relevant conferences and meetings, featuring special sections and associated symposia. A discussion forum allows for the rapid dissemination of ideas and opinions and addresses some of the most important issues facing biogeo-science today. Another interactive feature is an image gallery where pictures are exchanged freely for educational purposes. The growing collection of biogeoscientists is highlighted by interviews and

information about what types of research biogeoscientists are presently working on. Interviews with various program managers elicit the particulars of the funding process and provide insight into research funding decisions and important statistics.

Contact:

Sarah Leibson, Biogeosciences.org Web Coordinator, web@biogeosciences.org, (303) 357-1095.

Content related suggestions or comments are warmly encouraged.

*American Geophysical Union, American Society of Limnology and Oceanography, European Geosciences Union, Ecological Society of America, Geochemical Society, Geological Society of America, Mineralogical Society of America, and the Soil Science Society of America.

Pardee Symposium

Pre-Mesozoic Impacts: Their Effect on Ocean Geochemistry, Magnetic Polarity, Climate Change, and Organic Evolution

Tuesday, November 9, 8:00 am – Noon, CCC, Ballroom 4

*GSA Planetary Geology Division;
Paleontological Society*

Pre-Mesozoic time accounts for most of the major impacts by comets and meteorites here on Earth. Many of these far exceeded in magnitude and resulting mass extinctions those at the Cretaceous-Tertiary (K-T) boundary, and there is little question that the size and number of impacts decreased through Earth history.

Most meetings on Impacts and Extinctions, however, have been overwhelmed by talks on the K-T boundary, because of the popular appeal of the dinosaur extinction, and on the record of more recent, still highly visible craters. Pre-Mesozoic impacts have been studied intensively

during the past decade, but an adequate forum has never existed for presentation of the new data on oceanic, climatic, and biotic changes that they produced. Moreover, the record of pre-Mesozoic cratering has been largely obscured by later tectonism and burial, and hence has been overlooked or ignored by students of younger impacts.

Impact-induced glaciations in the Late Precambrian, Late Ordovician, and Late Devonian probably exceeded the length of Pleistocene glaciation by a whole order of magnitude. Some of the ancient mass extinctions were not instantaneous but resulted from series of comet or meteorite showers that gradually eliminated more and more biota over a period of several million years. There seems to be a regular pattern of impacts followed by changes in ocean temperatures and geochemistry, global mass extinctions during sea-level falls, and continental glaciation during and after which more extinctions occurred. Some impacts also were accompanied by geomagnetic changes and perhaps not coincidentally, by plate tectonic movements.

Biotic radiation into unoccupied niches following extinctions produced many new rapidly evolving forms of life. Just as in the case of mammals in relation to the K-T extinction event, many survivors of older extinctions were relatively unimportant life forms that had just begun to evolve prior to the impacts. This raises an interesting point on the survival of mankind after future impacts.

In summary, the record of pre-Mesozoic impacts contains much unspoken and unused data related to modern oceanic and climate changes and hence requires an adequate forum for its dissemination.

There will be a **complementary poster session** to accommodate presenters beyond the twelve that the Pardee Symposium time

restriction permits, and an **innovative Tuesday evening forum, "The Role of Impacts on Evolution" (7:30-9:30 pm, CCC Room 207)**, to allow discussion among speakers, poster presenters, and a general audience.

UPCOMING EVENTS:

Graduate Programs

Penn State now offers a unique graduate program in Astrobiology. The degree is a dual title Ph.D., meaning that each student has a primary program in the traditional sciences (astronomy, biology, biochemistry and molecular biology, chemistry, geosciences) and an additional emphasis in astrobiology. There are specific requirements for the dual-title Ph.D. degree, including on-campus and field classes and participation in the international research activities of Penn State's Astrobiology Research Center, part of the NASA Astrobiology Institute.

Students interested in the Astrobiology dual-title Ph.D. program should visit the following websites and contact Lee Kump lkump@psu.edu for further information: <http://www.psu.edu/bulletins/whitebook/programs/abiol.htm>
<http://psarc.geosc.psu.edu>

Requests for Resources

The **Microbial Life Educational Resources (MLER)** project is currently being developed through funding from the NSF National Science Digital Library program. The purpose of this digital library is to provide a contemporary and expanding resource of expert information about the ecology, diversity and evolution of micro-organisms for students, K-12 teachers, university faculty, as well as for the general public. Thematic collections of resources and services are currently in development. The initial themes will be directed to "Microbial life in extreme environments" and "Microbial life in oceans."
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We are soliciting contributions of resources to the **MLER** digital library from GSA Geobiology & Geomicrobiology Division members. The types of resources we are looking for include:

- 1) URLs of websites related to your research and/or teaching;
- 2) PowerPoint presentations, visualizations, and animations;
- 3) Journal articles, books, reports, news and commentary;
- 4) Activities;
- 5) Images;
- 6) Data, tools, and data products.

Please submit your resources to our "Contribute a Resource" page at <<http://serc.carleton.edu/microbelife/submitt01.html>>. We ask for basic information about the resource on a simple online form. Our staff will catalog the resources and display them in thematic digital collections on the **MLER** site. These resources will also be shared through the National Science Digital Library, which will give your resources even broader exposure across the scientific community. By contributing resources to the **MLER**, you will benefit directly because you will be addressing the NSF Broader Impacts criterion.

MLER is a collaboration between the Bay Paul Center Outreach Group, Marine Biological Laboratory, Woods Hole, David Patterson, co-PI; the Department of Earth Sciences, Montana State University, David Mogk, co-PI; and the Science and Education Resource Center (SERC), Carleton College, Cathy Manduca, Director. Other online educational resources of interest to GBGM members are Teaching Biocomplexity in the Geosciences <http://serc.carleton.edu/NAGTWorkshops/biocomplexity/index.html> and Geology and Public Health <http://serc.carleton.edu/NAGTWorkshops/health04/index.html>.

MEETING ANNOUNCEMENTS:

Goldschmidt Conference

TWO upcoming sessions of importance to the GBGM Division members will be held at the 2004 Goldschmidt Conference in Moscow, Idaho (20-25 May 2005).

Deadline for abstract submission of abstracts to the Goldschmidt Conference is January 15, 2005. For meeting details, see: <http://www.the-conference.com/2005/gold2005/index.php>

"Apatite: Bridging Geology, Biology and Materials Science," will focus on aspects that are unique, specific, or important for apatite that is formed under the direct regulatory control of organisms (the vast majority of which are vertebrates). Those aspects include small crystal size and large surface area (nanocrystallinity), shape (platelets, needles), orientation (alignment with collagen fibers), chemistry (e.g., role of carbonate, Na, Sr), and lattice perfection (effect of ionic substitutions on crystallinity), as well as the role of biological macromolecules.

Crystallographic and geochemical studies on inorganically formed carbonated apatites (geologic and synthetic) would be of special value to bridge knowledge gap that still exists in our understanding of bioapatite in bone and teeth. The organizers want to create a platform and format where scientists from different disciplines are comfortable sharing information and knowledge. Encouraged to contribute and participate are experts in geobiology, environmental mineralogy, crystallography, biomineralization, dentistry, human orthopedics and bone research, synthetic biomaterials, bone and dental implant materials, interface geochemistry, and nanogeoscience, as well as paleontologists dealing with the stable-isotope and trace-element composition of biological apatite.

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The apatite symposium is organized by Jill Pasteris, Brigitte Wopenka (both at Washington University in St. Louis), and Eva Valsami-Jones (Museum of Natural History, London). For details, please email bwopenka@levee.wustl.edu.

"Bridging the Technology Gap in Geomicrobiology: Novel Research Approaches in Extreme Environments."

The discovery of new microorganisms in nearly every extreme environment has led to novel geochemical, microbiological and genetic approaches in the characterization of microbial interactions and geomicrobial processes. These new techniques, when used in environments that exhibit high preservation potential, enhance our ability to detect evidence of early life on Earth and beyond.

Improvements in the spatial, temporal and concentration capabilities of high-resolution analytical (conventional and synchrotron-based) instruments, and the design of environmentally relevant *in situ* experimental systems/cells, are taking geomicrobiological studies to the next level. Examples of technological advances include instruments that monitor communities in the field and those that mimic natural systems with increasingly accurate thermal, temporal, compositional, and spatial scales in the laboratory.

This session aims to bridge the gap between varying scientific approaches that focus on elucidating microbial interactions and geomicrobial processes in extreme environments. Papers that report the results of innovative geomicrobial studies applied to the fields of paleobiology and astrobiology are particularly encouraged.

The symposium is organized by Sherry L. Cady (Portland State University) and Liane G. Benning (University of Leeds). For more details on the session, please email cadys@pdx.edu.

ESP2

The Earth System Processes 2 meeting is being held in Calgary next August. There'll be lots of good geobiology and geomicrobiology including a plenary lecture by Diane Newman. Website: <http://www.geosociety.org/esp2/>.

JOURNALS:

The Virtual Journal of Geobiology, a free "virtual journal" provided by Elsevier and edited by Lee Kump, is available online at <http://earth.elsevier.com/geobiology>. GBGM members can register for a monthly list of geobiology articles published by Elsevier and selected by me, or they can visit the website above. In either case, if your institution subscribes to Science Direct you can instantly download the article; if not, you can see the abstract.

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